

WE CLAIM:

1. A warewashing detergent composition comprising:
 - (a) a cleaning agent comprising a detergents amount of a surfactant;
 - (b) an alkaline source in an amount effective to provide a use solution having a pH of at least about 8 and obtained by diluting the warewashing detergent composition with water; and
 - (c) a corrosion inhibitor in an amount sufficient for reducing corrosion and/or etching of glass, the corrosion inhibitor comprising:
 - (i) a source of aluminum ion; and
 - (ii) a source of zinc ion.
2. A warewashing detergent composition according to claim 1, wherein the detergent composition comprises between about 0.5 wt.% and about 20 wt.% of the cleaning agent.
3. A warewashing detergent composition according to claim 1, wherein the amount of source of aluminum ion and the amount of source of zinc ion is sufficient to provide a weight ratio of aluminum ion to zinc ion of between about 6:1 and about 1:20.
4. A warewashing detergent composition according to claim 1, wherein the amount of source of aluminum ion and the amount of source of zinc ion is sufficient to provide a weight ratio of aluminum ion to zinc ion of between about 2:1 and about 1:15.
5. A warewashing detergent composition according to claim 1, wherein the detergent composition comprises between about 0.5 wt.% and about 25 wt. % of the corrosion inhibitor.

6. A warewashing detergent composition according to claim 1, wherein the cleaning agent comprises at least one of an anionic surfactant, a nonionic surfactant, a cationic surfactant, and a zwitterionic surfactant.
7. A warewashing detergent composition according to claim 1, wherein the alkaline source comprises at least one of a metal carbonate, an alkali metal hydroxide, and a mixture thereof.
8. A warewashing detergent composition according to claim 1, wherein the alkaline source comprises at least one of sodium carbonate, potassium carbonate, sodium bicarbonate, potassium bicarbonate, sodium sesquicarbonate, potassium sesquicarbonate, and mixtures thereof.
9. A warewashing detergent composition according to claim 1, wherein the alkaline source comprises at least one of sodium hydroxide, potassium hydroxide, and mixtures thereof.
10. A warewashing detergent composition according to claim 1, the source of aluminum ion comprises at least one of sodium aluminate, aluminum bromide, aluminum chlorate, aluminum chloride, aluminum iodide, aluminum nitrate, aluminum sulfate, aluminum acetate, aluminum formate, aluminum tartrate, aluminum lactate, aluminum oleate, aluminum bromate, aluminum borate, aluminum potassium sulfate, aluminum zinc sulfate, aluminum phosphate, and mixtures thereof.
11. A warewashing detergent composition according to claim 1, wherein the source of zinc ion comprises at least one of zinc chloride, zinc sulfate, zinc nitrate, zinc iodide, zinc thiocyanate, zinc fluorosilicate, zinc dichromate, zinc chlorate, sodium zincate, zinc gluconate, zinc acetate, zinc benzoate, zinc citrate, zinc lactate, zinc formate, zinc bromate, zinc bromide, zinc fluoride, zinc fluosilicate, zinc salicylate, and mixtures thereof.

12. A warewashing detergent composition comprising:
 - (a) a cleaning agent comprising a detergents amount of a surfactant;
 - (b) an alkaline source in an amount effective to provide the warewashing detergent composition with a pH of at least about 8; and
 - (c) between about 6 ppm and about 300 ppm of a corrosion inhibitor for reducing corrosion and/or etching of glass, the corrosion inhibitor comprising an aluminum ion and a zinc ion at a weight ratio of the aluminum ion to the zinc ion of between about 6:1 and about 1:20.
13. A warewashing detergent composition according to claim 12, wherein the weight ratio of aluminum ion to zinc ion is between about 2:1 and about 1:15.
14. A warewashing detergent composition according to claim 12, wherein the warewashing detergent composition has a solids content of between about 0.05 wt.% and about 0.75 wt.%.
15. A warewashing detergent composition according to claim 12, wherein the cleaning agent is provided in the warewashing detergent composition in an amount of between about 0.5 wt.% and about 20 wt.%.
16. A warewashing detergent composition according to claim 12, wherein the warewashing detergent composition comprises about 0.1 wt.% to about 70 wt.% chelating/sequestering agent.
17. A warewashing detergent composition according to claim 12, wherein the warewashing detergent composition comprises about 0.1 wt.% to about 10 wt.% bleaching agent.

18. A warewashing detergent composition according to claim 12, wherein the warewashing detergent composition comprises about 1 wt.% to about 20 wt.% detergent filler.
19. A warewashing detergent composition according to claim 12, wherein the warewashing detergent composition comprises about 0.01 wt.% and about 3 wt.% defoaming agent.
20. A warewashing detergent composition according to claim 12, wherein the warewashing detergent composition comprises about 0.5 wt.% to about 10 wt.% anti-redeposition agent.
21. A warewashing detergent composition according to claim 12, wherein the warewashing detergent composition comprises about 2 wt.% to about 10 wt.% water.
22. A warewashing detergent composition according to claim 12, wherein the warewashing detergent composition comprises about 20 wt.% to about 40 wt.% water.
23. A warewashing detergent composition according to claim 12, wherein the warewashing detergent composition comprises a block having a size of at least about 5 grams.
24. A warewashing detergent composition according to claim 12, wherein the warewashing detergent composition comprises a block having a size of at least about 50 grams.
25. A method for using a warewashing detergent composition, the method comprising:

(a) diluting a warewashing detergent composition with water at a dilution ratio of water to warewashing detergent composition of at least about 20:1, wherein the warewashing detergent composition comprises:

- (i) a cleaning agent comprising a detergents amount of a surfactant;
- (ii) an alkaline source in an amount effective to provide a use solution having a pH of at least about 8;
- (iii) a corrosion inhibitor in an amount sufficient for reducing corrosion and/or etching of glass, the corrosion inhibitor comprising a source of aluminum ion and a source of zinc ion; and

(b) washing ware with the use solution in an automatic dishwashing machine.

26. A process according to claim 25, wherein the amount of source of aluminum ion and the amount of source of zinc ion is sufficient to provide a weight ratio of aluminum ion to zinc ion of between about 6:1 and about 1:20.

27. A process according to claim 25, wherein the amount of source of aluminum ion and the amount of source of zinc ion is sufficient to provide a weight ratio of aluminum ion to zinc ion of between about 2:1 and about 1:15.

28. A process according to claim 25, wherein the detergent composition comprises between about 0.5 wt.% and about 25 wt. % of the corrosion inhibitor.

29. A process according to claim 25, wherein the cleaning agent comprises at least one of an anionic surfactant, a nonionic surfactant, a cationic surfactant, and a zwitterionic surfactant.

30. A process according to claim 25, wherein the alkaline source comprises at least one of a metal carbonate, an alkali metal hydroxide, and a mixture thereof.

31. A process according to claim 25, wherein the alkaline source comprises at least one of sodium carbonate, potassium carbonate, sodium bicarbonate, potassium bicarbonate, sodium sesquicarbonate, potassium sesquicarbonate, and mixtures thereof.

32. A process according to claim 25, wherein the alkaline source comprises at least one of sodium hydroxide, potassium hydroxide, and mixtures thereof.

33. A process according to claim 25, the source of aluminum ion comprises at least one of sodium aluminate, aluminum bromide, aluminum chlorate, aluminum chloride, aluminum iodide, aluminum nitrate, aluminum sulfate, aluminum acetate, aluminum formate, aluminum tartrate, aluminum lactate, aluminum oleate, aluminum bromate, aluminum borate, aluminum potassium sulfate, aluminum zinc sulfate, aluminum phosphate and mixtures thereof.

34. A process according to claim 25, wherein the source of zinc ion comprises at least one of zinc chloride, zinc sulfate, zinc nitrate, zinc iodide, zinc thiocyanate, zinc fluorosilicate, zinc dichromate, zinc chlorate, sodium zincate, zinc gluconate, zinc acetate, zinc benzoate, zinc citrate, zinc lactate, zinc formate, zinc bromate, zinc bromide, zinc fluoride, zinc fluosilicate, zinc salicylate, and mixtures thereof.

35. A method for manufacturing a warewashing detergent composition, the method comprising:

(a) providing an amount of corrosion inhibitor in a warewashing detergent composition concentrate sufficient to provide a level of corrosion inhibitor in a use solution as a result of diluting the warewashing detergent concentrate with water at a ratio of water to the warewashing detergent concentrate of at least about 20:1 corresponding to the following formula:

$$\text{Corrosion inhibitor} > \frac{[\text{alkalinity (ppm)} + \text{builder (ppm)}]}{[\text{hardness (grains/gallon)} + \text{food soil (grams/gallon)}]} + \frac{[\text{alkalinity (ppm)} + \text{builder (ppm)} - 200]}{20} + 10$$

wherein the alkalinity refers to the alkalinity in ppm of the use solution, the builder refers to the amount of builder in ppm in the use solution, the hardness refers to the amount of hardness in grains per gallon in the use solution, and

the food soil refers to the expected amount of food soil in grams per gallon in the use solution; and

wherein the corrosion inhibitor comprises a weight ratio of aluminum ion to zinc ion of between about 6:1 and about 1:20, and the warewashing detergent composition concentrate further comprises a cleaning agent and an alkaline source.

36. A method according to claim 35, further comprising:

(a) solidifying the warewashing detergent concentrate.

37. A method according to claim 35, wherein the warewashing detergent concentrate comprises between about 0.5 wt.% and about 20 wt.% of the cleaning agent.